Math 1116, Quiz #3, Fall 2013 Name KEY

Instructions: Use correct notation and show all work. Be sure to clearly label all winners of elections.

1. Suppose your favourite bakery has 11 different pastries that you just love, but you can't purchase all of them every week. How many weeks will it take(i.e. how many ways) are there to choose 4 pastries each week until you've tried all the possible combinations?

$11C4 = 330$ weeks ≈ 6.3 years!

2. Find the winner of the election shown below according to the Borda Count method. Who is the winner of the election using the Plurality Method? Does this election produce a fairness violation? If so, which one?

# of votes	8	7	6	2	1
1st	A	D	D	C	E
2nd	B	B	B	A	A
3rd	C	A	E	B	D
4th	D	C	C	D	B
5th	E	E	A	E	C

A = 8(5) + 7(3) + 6(1) + 2(4) + 1(4) = 79

B = 8(4) + 7(4) + 6(4) + 2(3) + 1(2) = 92 ← !! B wins by Borda Count

C = 8(3) + 7(2) + 6(2) + 2(5) + 1(1) = 61

D = 8(2) + 7(5) + 6(5) + 2(2) + 1(3) = 88

E = 8(1) + 7(1) + 6(3) + 2(1) + 1(5) = 40

A = 8

B = 0

C = 2

D = 7+6 = 13 ← majority!

E = 1

8+7+6+2+1 = 24

12+1 = B majority

By Plurality, D wins.

This is a violation (the Borda count result) of the majority criterion since D has a majority of first place votes, but the B.C. method says that B won the election.